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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,877	01/29/2001	Aomar Halimaoui	5310-03000	8711

7590 07/10/2002

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EXAMINER

NOVACEK, CHRISTY L

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 07/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,877

Applicant(s)

HALIMA OUI ET AL.

Examiner

Christy L. Novacek

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-7,9,11,12 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9,11,12 and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the amendment filed March 25, 2002.

Response to Amendment

The amendment to the specification is sufficient to overcome the objections to the specification as stated in the previous Office Action. Therefore, these objections are withdrawn.

The amendment of claim 1 is sufficient to overcome the rejection of claims 1-16 under 35 U.S.C. 112, second paragraph as stated in the previous Office Action. Therefore, this rejection is withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 3-5, 9, 11, 12, and 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergeron et al.

In reference to claim 1, Bergeron discloses a method of growing a silicon oxide layer (12/20) of non-uniform thickness on a silicon substrate (2/10) comprising the steps of implanting

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helium or neon (18) into predetermined regions of the substrate and oxidizing the surface of the substrate, wherein the helium and neon increase the oxidation rate of the substrate (Fig. 1D-1E; col. 3, ln. 24-col. 4, ln. 20).

In reference to claim 3, the implantation step into predetermined regions of the substrate is an ion implantation step (col. 3, ln. 39-50).

In reference to claims 4, 9, and 11, the implantation energy of the ions is 10-500 keV (col. 3, ln. 47-50).

In reference to claims 5, 12, 14, 15, and 16, the implanted dosage of ions is $10^{12} - 10^{16}$ atoms/cm² (col. 3, ln. 47-50).

Claim 17 is rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al.

In reference to claim 17, Wu discloses a method of growing a silicon oxide layer (42/44) of non-uniform thickness on a silicon substrate (22) comprising the steps of implanting helium (28) into predetermined regions of the substrate and oxidizing the surface of the substrate, wherein the helium increases the oxidation rate of the substrate (Fig. 1-3; col. 4, ln. 6-33). A MOS transistor is subsequently formed at the regions of the substrate having the silicon oxide layer (col. 1, ln. 27-57; col. 2, ln. 40-42; col. 4, ln. 31-33).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergeron et al. in view of Tzeng (US 5,215,934, previously cited).

In reference to claims 6 and 7, Bergeron discloses that the oxidation of the substrate is a thermal oxidation that is conducted at a temperature of 800-1200°C for 0.5 minutes to 10 hours in a mixture of dry oxygen and steam (col. 4, ln. 20-35). Bergeron does not specifically disclose what type of vessel this thermal oxidation step is conducted within. Like Bergeron, Tzeng discloses a method of thermally oxidizing a silicon substrate that has been implanted with oxidation-rate-enhancing ions (Abstract). Tzeng discloses that this oxidation step may be successfully accomplished by thermally oxidizing the substrate at a temperature of about 950°C for approximately 10 minutes in a dry oxygen atmosphere within a furnace (col. 6, ln. 9-15). At the time of the invention, it would have been obvious to one of ordinary skill in the art to conduct the oxidation process of Bergeron within a furnace as taught by Tzeng because both Bergeron and Tzeng are conducting the same type of oxidation process.

Response to Arguments

Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection. However, the Examiner would like to respond to one of Applicant's arguments for clarification purposes. In the previous Office Action, claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Tzeng because, although Tzeng did not teach conducting the ion implantation at an ion dosage within the range recited in Applicant's claim 12, it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to use routine experimentation to find an appropriate ion dosage level because the methods of doing so are well known in the art. Applicant has requested the Examiner to provide support for this assertion. Accordingly, the Examiner hereby makes reference to US 5,869,385, Tang et al. The Tang et al. patent discloses a method of implanting

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oxidation-rate-enhancing ions into a silicon substrate, and subsequently thermally oxidizing the substrate to provide a silicon oxide layer of non-uniform thickness. Lines 42-47 in column 6 of the Tang patent states, "The concentration of implanted atoms and implantation conditions in accordance with the preferred embodiment are parameters which one having ordinary skill in the art could easily optimize in a particular situation given the disclosed objective of selectively increasing the oxidation rate of the silicon substrate in the field oxide region."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christy L. Novacek whose telephone number is (703) 308-5840. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30 - 5:00.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

CLN

June 27, 2002


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800